The Biologist

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THE BIOLOGIST

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THE BIOLOGIST

THE OFFICIAL ORGAN OF THE PHI SIGMA HONORARY BIOLOGICAL SOCIETY

VOL. II. COLUMBUS, OHIO, JUNE, 1917 No. 5

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Fauna and Flora of the Florissant Beds.

E. H. Stewart, Epsilon.

The deposits at Florissant, Colorado, that have given up so many of the remains of former life in the Rocky Mountain region lie in the central part of the State and consist of the shale that has hardened from the mud that was laid down in the bottom and around the edges of the old prehistoric lake that formerly occupied a portion of the region. Lake George, which is really little more than a swelling on the South Platte river is the survivor of this ancient body of water that covered many square miles and drained into the Arkansas river during Miocene times.

Prof. W. C. Strieby of Colorado College was one of the early explorers of the region and has done much to awaken interest in the deposits by the popular lectures he has given on them. The British Museum sent an expedition to the place in 1877 which did a great deal of good work and many of the best specimens are now in London.

During the last few years I have visited the site several times and during the summer of 1913, Prof. I. E. Cutler of the University of Denver, accompanied by Mr. Munz and Mr. Owen, spent some time exploring and collecting specimens. The collection that they made being one of the best that has been made, considering its size.

During the Miocene time the climate must have been mild, for the Flora is distinctly southern and subtropical, as most of the species that are found have now retreated to Mexico, California or the Gulf States. On the whole it may be said that the Flora is similar to that of Elko, Nevada, and slightly younger than that of the Green River Beds.

Many of the best specimens were found at a point on the southwestern shore line where there is evidence that a considerable stream entered the lake, washing in material and covering at the same time.

Two things seem to be responsible for the change in the Flora towards Pliocene time, the first the increasing cold and aridity of the region would cause a very marked change as is well proven by the southward recession of the one prevalent subtropical forms; the second was the geological changes that took place in the locality. The geological change seems to have taken the form of a volcanic eruption which, while it was not violent enough to cause any serious destruction or produce great lava flows, was sufficient to cause a very general warping of the locality so that the drainage, instead of being south into the Arkansas as formerly, was turned north into the Platte. This warping caused a marked deepening of the lake and a consequent raising of the shore line. There is good evidence that this warping was fairly sudden, for several dozens of Sequoia trees that were growing on the lake shores were suddenly submerged for several feet above the ground and they semed to have decayed at the water's edge, for when they were first studied their tops were all at practically the same level regardless of the variation of the level of the land they stood on. The stumps are nicely fossilized up to what was appartnly the water's edge with almost pure silica. They have largely been broken up and carried away by tourists during the last few years so that a good study of them is out of the question at the present time and we are forced to rely on the work of some men, such as Prof. Strieby, who saw them many years ago. Sections of these stumps can scarcely be identified under the microscope from the modern Sequoia sempervirens or gigantea of California. However, it has been classified as Sequoia haydeni.

Another good evidence that the land warping was caused by gentle volcanic action is the existence of several volcanic necks or intrusions in the district that seem to be of that age. Several of these are in the bed of the old lake itself, the most noted one being at the northeast edge of the town of Florissant. The force of the volcanic action seems to have been sufficient to produce the warping and to barely break through the surface here and there in a doughy mass and form small necks.

Out of some four hundred specimens that are in the museum of the biological department at the University of Denver that have come from these deposits, none had been classified or even analyzed to amount to anything until the winter of 1916-17, when I took it up and spent some three months' time on it with the result that I analyzed and classified about one hundred and fifty.

The following is a brief enumeration of the specimens that were identified with a fair degree of correctness. However, at this point I must make the same statement that all others who have worked in this field have made, namely, that many mistakes have been made and many will be made that will have to be corrected as new material comes to light.

Lycopodiaceae, Lycopodium annotinum
Celastraceae, Pachistima canbyi,
    Celastrinites elegans,
    Celastrus fraxinifolius,
    Celastrus greithianus.

Hydrangeaceae, Hydrangea subincerta,
Fagaceae, Quercus dyratiformis,
Quercus balaninorum
Moraceae, Morus symmetrica.
    The photograph of the specimen of this one has also a leaf of Ulmus tenuinervis superimposed upon it.

Typhaceae, Typha lesquereuxi,
Umbelliferae, Oxypolis destructus,
Rosaceae, Rosa wilmattae,
Sapindaceae, Sapindus coloradensis,
Polypodiaceae, Dryopteris scansa,
Oleaceae, Osmanthus praemissa,
Malaceae, Sorbus megaphylla

Juglandaceae, Julgans costata,
Ulmaceae, Ulmus tenuinervis,
    Ulmus longifolia,

Salicaceae, Populus crassia,
    Salix ? Many specimens of this genus.

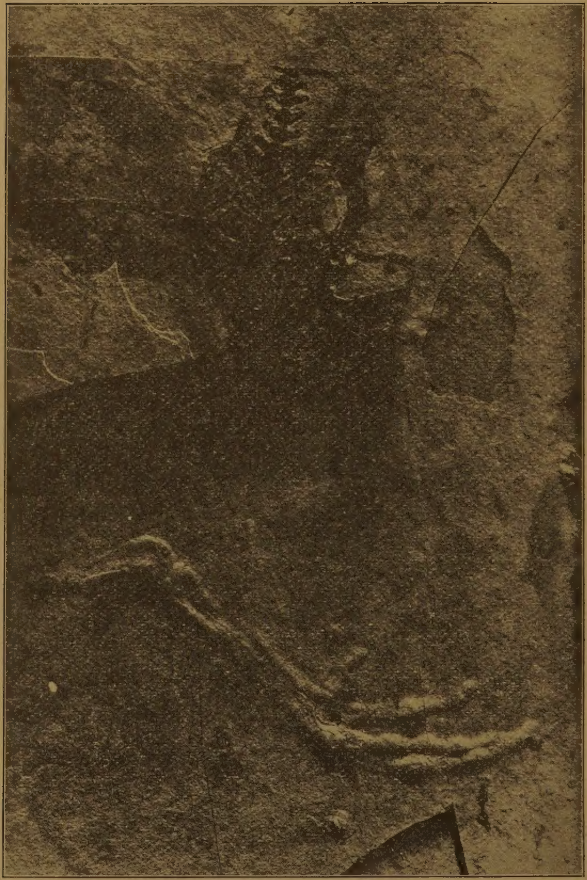
Coniferae, Sequoia haydeni,
    Pinus florissanti,
    Thuya plicata,
    Thuya occidebtalis.

FAUNA

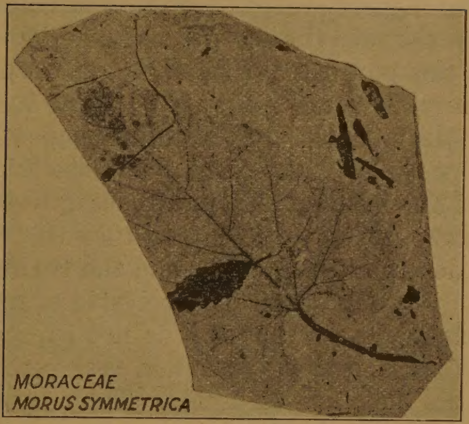
Diptera, Mydasidae, midas clavatus
    Asilidae, trupanea apivora.

Hymenoptera, Formicina, many specimens.
Gastropoda, Pulmonata.
Pisces, the remains of two specimens which are not sufficient for identification.

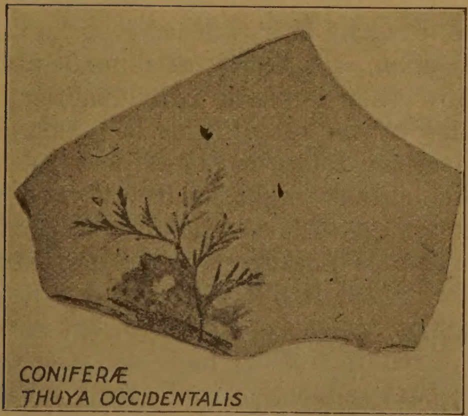
Aves, the fossils of birds are very rare in this field, and while this one has not been identified as yet, it is a very fair specimen. The obverse is now at Washington in the hands of government experts for study.



FOSSIL OF A BIRD FOUND IN THE FLORISSANT BEDS



MORACEAE
MORUS SYMMETRICA



CONIFERÆ
THUYA OCCIDENTALIS

Should the Biologist Be Continued?

A. E. Woller, Alpha.

At the end of our first year of trying to furnish a means for Phi Sigmas everywhere to communicate with one another we must face the question of whether "The Biologist" serves this purpose. If it has not succeeded in a year it cannot be worth while trying to continue it. The Alpha chapter, by its financial support, first made the journal's publication possible. Mr. Reed has unselfishily given a great deal of his valuable time in attending to the details of getting out the copies which constitute the first volume. For this he deserves much credit and the thanks of each of the readers. It would be an inconceivable effrontery to ask him to continue the journal if it is not appreciated and a waste of effort if it does not fill a real need. This is a matter for the members to decide. Their support will determine its existence in the future.

If I may be permitted to do so, I should like to call attention to what has been accomplished during the life of "The Biologist" so that each one may decide for himself the influence it might have wielded in bringing these projects to completion. It has first of all made possible nationality. The invitation to merge individualities into a larger group standing by the same ideals of a God-given earnest devotion to science could not have been so strongly presented if the journal, slight as it was, had not been on hand to offer some evidence of the promise contained in the invitation. This is notably true in the case of Epsilon chapter. How much it has done to win the afiliation of the other groups cannot be estimated, but it was no doubt important. Even if Epsilon had been the only research club to have been influenced, that seems sufficient to warrant the journal's continuance.

No one who has looked over the lists of abstracts and the titles of the publications of some of our more distinguished members can avaid being struck with the magnitude and importance of the work of others. He can say to himself with pardonable pride, "Here is one of us, see how much he has accomplished." There is no denying the importance of this as an incentive to raise the standard of quality in one's personal endeavors. The same influence for good that comes of the instructors and their students fraternizing in the chapter meetings is continued in the journal when the work of the students, whose achievements happen to have covered a longer period of years, is placed beside the work of those who are just taking their stride. The remarkable degree of frank intimacy entirely without familiarity is a unique and commendable feature of "The Biologist."

Until recently progress in science was marked by an increasing segregation of subjects. The workers were distributed into numerous pigeon holes and labeled. A scientist in one pigeon hole knew little of the activities of his colleagues and cared less. This segregation was immensely useful while the technique of the various lines of endeavor was being developed, but were are at last beginning to realize that nature is not pigeon holed, but is a great synthesis. We are also beginning to understand that to make progress in science, which is to synthesize our results, we must co-operate with the workers in other fields than our own immediate one. "The Biologist" has inspired confidence in the feeling that we are making progress. It has done more than that, for it offered a step in the direction of synthesizing efforts that to reach their full development needed to be combined with the expert knowledge and assistance that some one else could offer.

And finally but of no less degree of importance, it has given the opportunity for some of us to publish original work that otherwise may not have come to light for some time. The standard of this work is unquestionably high as it must be if it is to be worth while. But the same fraternizing spirit that makes meeting a success, that has already been mentioned in regard to benefits of comparing the work of the more experienced and the less experienced is again exhibited. While the work of the more distinguished members is always most welcome and will always continue to be published, if the journal goes on, yet it is from the rank and file that we hope to have the greatest number of our contributions. For after all, our real advances are not made through the distinguished few, but by the slight advances made by the greatest number.

I believe we are now in a position to consider whether or not "the Biologist" should be continued.

Our Duty

A. E. Woller, Alpha 8.

It would be superfluous at this time to urge members of Phi Sigma to help in "making the world safe for democracy." They have already shown public spiritedness or they would not belong to a society devoted to the encouragement of scientific research. We are all under a moral obligation which we cannot evade to try to make the world a better place for our having come into it, and for some of us in making the supreme sacrifice during the greatest constructive experiment. But loyalty is not sufficient. We must at once show a willingness to readjust ourselves to war conditions in order to carry our social service to the highest degree. There is plenty of patriotism in the hearts of us, yet unless it is organized and directed much of it may be wasted through duplication and misplaced effort. A few suggestions in answer to the question "What can I do?" may not be untimely since there are a number whom the Conscription Bill does not reach because of the age limits.

Enlist for naval or military service.

Join an already organized effort to serve such as the Red Cross, which may be supported by either service or money or both, or the Home Defense League.

Cultivate vacant land in the city or the country to increase the farm and garden acreage of food crops. Encourage the younger boys and girls to work in your garden. Superintend gardens made by children.

Do not be afraid to express your loyal sentiments. Urge others in your conversation to show their loyalty.

Avoid waste, particularly of paper, linen, metals, leather and food.

To become overexcited is to lose your grpi on loyalty. Do not become so tense as to neglect your accustomed recreations. They keep you efficient.

Make a careful record of all the Phi Sigmas of your chapter who enlist. Follow them with letters, magazines and books. Their endurance will be sustained thereby and their hardships not magnified.

Under all conditions teach, talk and think those ideals which promote beneficial learning. For we are not unlikely to become partly Prussianized, as England already has, in order to fight Prussianism. We must at the start try to overcome the deadening effects of this.

Alpha

Mr. Max Kisliuk, Jr., is going to the Bureau of Entomology of the United States Department of Agriculture as a scientific assistant. He will study southern field crop insects during the summer in continuance of his studies on insects affecting the health of man.

Mr. Jasper D. Sayre will accompany the Mt. Katmai expedition of the National Geographic Society this summer. Dr. R. F. Griggs of the Department of Botany of the Ohio State University will lead the party which is to be composed of eight scientists and two guides. The explorers expect to sail for Kodiak, Alaska, on May 28th, and remain until the middle of September.

Mr. Sayre intends to study the fungi, principally the soil bacteria and those causing plant diseases. Since the region near Mt. Katmai was covered with sterile ash, in some places to a depth of fifteen feet, as the result of the dust explosion which featured the eruption of this volcano, an excellent opportunity is offered to study the early stages of revegetation as illustrated by the lowest forms of plant life.

Mr. R. A. Knouff has enrolled for work toward his doctorate in the Anatomy Department of the University of Chicago. He is preparing to leave Columbus within the next few weeks.

The recent Sigma Xi elections included the following members of Phi Sigma: Miss Mabel E. Stehle, Messrs. Rollo C. Baker, James I. Hambleton, now at University of Wisconsin, Max Kisliuk, Jr., Jasper D. Sayre and Adolph Waller.

Mr. W. W. Randolph has reported for military service in the Reserve Officers Training Camp, which recently opend at Fort Benjamin Harrison.

Mr. Paul Sears has volunteered his services for the summer to the Ohio Agricultural Experiment Station at Wooster, Ohio. Recently Mr. Sears obtained a year's leave of absence from the instructional force of the University and intends to engage in private research which is to be carried on either in the University or the Experiment Station.

E. R. Logan, M. D., '17, has volunteered for service in the Naval Medical Reserve.

On account of the recent order of Governor Cox that all male students in the University not registered in professional courses, the graduate school or the graduating class, should be refused the right to attend classes, the activities of all organizations have been seriously handicapped. Alpha has been a sufferer in this respect inasmuch as this action has so seriously disturbed things that it has been found impossible to continue the year's program. Consequently, there was no spring election of members and it has been impossible to even elect officers for next year.

BIOLOGY MEN EXPERIMENT FOR GOVERNMENT USE

Professor Cutler Begins Experiments With Large Variety of Seeds.

The University of Denver is now among the schools of the country on the list to do experimental work in agriculture for the United States government.

Professor Cutler of the Biological Department is in charge of the work and has already begun to make experiments in corn.

The government has been collecting corn from every corner of the earth and has made a collection of over two hundred varieties. These specimens are to be tested out in several different states of the Union to ascertain their adaptability to the various climatic, edaphic and cultural conditions of our country.

All subdivisions (Pod, Sweet, Dent, Flint, Pop and Flour) are represented, but some very poorly as there is but one sample of the sweet subdivision; only a few specimens of the Everter or pop varieties. The remaining subdivisions are more equally divided.

The variety having the largest kernels is of the soft or flour type coming from Peru; eight kernels placed end to end measure six inches. This is called the Cuzco corn.

The kernels of the smallest variety are scarcely larger than the kernels of wheat.

As to the colors, all the primary colors and a great many combinations are found.

I know of no one of our cereals that show such variety of form, size, color, texture and cultural adaptabilities as can be seen in this large collection of corn. It surely shows what selection, climate, soil, and cultivation can do to change the character and development of a plant.

The ancestry. Our corn in all its varieties has sprung from the small and insignificant variety known as Zea tunicata, a form that has each kernel enclosed in its own tiny husk.

It is hoped that some variety may be found in the collection that will be especially adapted to our Colorado climate.

Besides the mere selection of varieties is to be carried on by hybridization to combine the best qualities of the ones that are best adapted to this region.

All this work is being done under the direction of Professor C. P. Hartley, head of the Corn Testing Department of the United States of America.—Denver Clarion.

GARDEN WORK IS PROGRESSING

Plants of Medicinal Use Will Be Raised as Experiments.

With the opening of the Pharmacutical Department of the University, Professor Cutler began making preparations for a garden, south of the gymnasium, in which all of the medicinal plants that can be grown in this climate could be cultivated.

The garden was started in the fall by the agriculture class and had a fair start, but owing to the early winter, operations were discontinued. Since the ground has become adaptable for planting, Professor Cutler and his corps of assistants and students have been busy setting out plants and planting seed for future crops.

The object of the work is to acquaint the pharmacy students with the plants from which our valuable drugs are obtained and to furnish material for the regular botanical work in the University.

The ground has been carefully prepared and hundreds of plants and shrubs have already been planted. A garden of this nature must of necessity be a work of years and by the end of the season there will be something like two hundred species growing to show that much can be done in one season.

Digitalis is one of the plants to be grown in large quanties. All different species are to be grown and each tested out, as to its adaptability to the region, manner and strength of growth, and the digitallen content.

Any one interested in the work may be of assistance by sending in specimens of plants or by donations in money.—Denver Clarion.

The National Officers

As a result of the recent election we are pleased to announce that Mr. Harold Cummins of Beta has been chosen by a majority of the Chapters as our next Grand President. Mr. Cummins was a member of the Natural Science Club of the University of Michigan and a charter member and secretary of Beta Chapter. While in school he was honored by election to both Phi Beta Kappa and Sigma Xi.

His training as a scientist has been a rather versatile one since he has served assistantships in both botany and zoology and has publications to his credit in both lines. He is at present an instructor in histology and embryology in the Vanderbilt University Medical School at Nashville, Tenn.

Our associations with Mr. Cummins have been only by correspondence, but we feel certain that the society has made no mistake in choosing him for its executive officer for the next year. And it is urged upon the Chapters to sup-